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EXAMINER

GIBSON, ERIC M

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3661

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Please find below and/or attached an Office communication concerning this application or proceeding.

DETAILED ACTION

Claim Objections

1. Claims 19 and 20 are objected to because of the following informalities:
 - a. In claim 19 at line 5, "of" in the phrase "in real-time of if" should be deleted.
 - b. Claim 20 is necessarily objected as being dependent upon an objected base claim.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1, 7, 8, 11, 12, 15, 18-20, 23, 26-29, 36, 37, 39, 43, 48, 49, and 51 are rejected under 35 U.S.C. 102(b) as being anticipated by Kesler et al. (US005791063A).
 - a. Per claim 1, Kesler teaches a track analyzer including a track detector for determining track parameters (36, figure 2) and a computing device (52, figure 2) for determining in real time if the track parameters are within acceptable tolerances and if not, generating corrective measures (column 5, lines 40-47).
 - b. Per claim 7, Kesler teaches that the computing device determines a plurality of calculated parameters as a function of track parameters, determines in real

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time if the calculated parameters are within acceptable tolerances and if not, generates corrective measures (column 5, lines 7-64).

- c. Per claim 8, Kesler teaches generating corrective measures in real time (column 5, lines 45-47).
- d. Per claim 11, Kesler teaches a display (50, figure 2).
- e. Per claim 12, Kesler teaches an AD converter (38, figure 2).
- f. Per claim 15, Kesler teaches a lookup table (52, figure 2).
- g. Per claim 18, Kesler teaches a method for analyzing a track including determining track parameters (36, figure 2), determining in real time if the track parameters are within acceptable tolerances and if not, generating corrective measures (column 5, lines 40-47).
- h. Per claim 19, Kesler teaches determining a plurality of calculated parameters as a function of the track parameters, determining in real-time if they are within acceptable tolerances and if not, generating corrective measures (column 5, lines 1-47).
- i. Per claim 20, Kesler teaches that the corrective measures are generated in real time (44-47).
- j. Per claim 23, Kesler teaches a display (50, figure 2).
- k. Per claim 26, Kesler teaches a lookup table (52, figure 2).
- l. Per claim 27, Kesler teaches identifying the severity of faults and indicating corrective measures to be implemented immediately and within a predetermined schedule (column 5, lines 55-63).

m. Per claim 28, Kesler teaches that one of the exemplary parameters considered includes curvature (column 5, line 2).

n. Per claim 29, Kesler teaches a track analyzer including a track detector for determining track parameters (36, figure 2), a vehicle detector for determining vehicle parameters (40, figure 2), and a computing device (52, figure 2) for determining in real time if the track parameters are within acceptable tolerances and if not, generating corrective measures (column 5, lines 40-47).

o. Per claim 36, Kesler teaches determining a plurality of calculated parameters as a function of the track parameters, determining in real-time if they are within acceptable tolerances and if not, generating corrective measures (column 5, lines 1-47).

p. Per claim 37, Kesler teaches that the corrective measures are generated in real time (44-47).

q. Per claim 39, Kesler teaches a display (50, figure 2).

r. Per claim 43, Kesler teaches a method including determining track parameters (36, figure 2), determining vehicle parameters (40, figure 2), and determining in real time if the track parameters are within acceptable tolerances and if not, generating corrective measures (column 5, lines 40-47).

s. Per claim 48, Kesler teaches determining a plurality of calculated parameters as a function of the track parameters, determining in real-time if they are within acceptable tolerances and if not, generating corrective measures (column 5, lines 1-47).

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t. Per claim 49, Kesler teaches that the corrective measures are generated in real time (44-47).

u. Per claim 51, Kesler teaches a display (50, figure 2).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 2, 3, 5, 6, 13, 24, 30-32, 40, and 52, are rejected under 35 U.S.C. 103(a) as being unpatentable over Kesler in view of Andersson et al. (US005787815A).

a. Per claims 2, 3, 5, 6, and 30-32, Kesler teaches the invention as explained in the rejection of claims 1 and 29. Kesler teaches a plurality of track sensors including gyroscopes (column 3, line 51 – column 4, line 5) and gage (column 5, lines 1-12) and explicitly mentions a rate gyro as one example of a geometric track sensor (column 4, lines 4). Kesler provides no more specific information about using gyroscopes or accelerometers to measure track parameters. However, this information would have been obvious to one of ordinary skill in the art at the time of the invention.

Accelerometers or gyroscopes, both mechanical and solid-state equivalents, were known and used at the time of the invention to measure track parameters. Andersson is cited as one exemplary reference in the art where gyroscopes are used to measure track parameters. It would have been obvious to one of ordinary skill in the art, at the

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time of invention, to use mechanical or solid-state gyroscopes to measure track parameters, as considered by Kesler and known to one of ordinary skill in the art at the time of the invention, evidenced by Andersson.

b. Per claim 13, Kesler teaches the invention as explained in the rejection of claim 1. Kesler does not teach communicating the corrective measures to a locomotive control computer associated with a vehicle. Andersson teaches a track parameter sensing and storing system that further communicates track parameters and corrective measures to a locomotive control computer (column 5, lines 15-22). It would have been obvious to one of ordinary skill in the art, at the time of invention, to communicate the corrective measures and track parameter data to a locomotive control computer so that the vehicle may make immediate corrective maneuvers for added safety, as taught by Andersson.

c. Per claim 24, Kesler teaches the invention as explained in the rejection of claim 18. Kesler does not teach communicating the corrective measures to a locomotive control computer associated with a vehicle. Andersson teaches a track parameter sensing and storing system that further communicates track parameters and corrective measures to a locomotive control computer (column 5, lines 15-22). It would have been obvious to one of ordinary skill in the art, at the time of invention, to communicate the corrective measures and track parameter data to a locomotive control computer so that the vehicle may make immediate corrective maneuvers for added safety, as taught by Andersson.

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d. Per claim 40, Kesler teaches the invention as explained in the rejection of claim 29. Kesler does not teach communicating the corrective measures to a locomotive control computer associated with a vehicle. Andersson teaches a track parameter sensing and storing system that further communicates track parameters and corrective measures to a locomotive control computer (column 5, lines 15-22). It would have been obvious to one of ordinary skill in the art, at the time of invention, to communicate the corrective measures and track parameter data to a locomotive control computer so that the vehicle may make immediate corrective maneuvers for added safety, as taught by Andersson.

e. Per claim 52, Kesler teaches the invention as explained in the rejection of claim 43. Kesler does not teach communicating the corrective measures to a locomotive control computer associated with a vehicle. Andersson teaches a track parameter sensing and storing system that further communicates track parameters and corrective measures to a locomotive control computer (column 5, lines 15-22). It would have been obvious to one of ordinary skill in the art, at the time of invention, to communicate the corrective measures and track parameter data to a locomotive control computer so that the vehicle may make immediate corrective maneuvers for added safety, as taught by Andersson.

4. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Kesler and Andersson as applied to claim 3 above, and further in view of Erspamer (US003931747A).

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a. Per claim 4, the combination teaches the invention as explained in the rejection of claim 3. The combination does not disclose a mechanical vertical gyroscope with the claimed mechanical features. Mechanical gyroscopes are well known in the art. They have been used for decades to determine inertial parameters of vehicles. Erspamer teaches one such known mechanical gyroscope that discloses an inner and outer gimbal and a spin motor (see figure 1). It would have been obvious to one of ordinary skill in the art, at the time of invention, to use a mechanical gyroscope of a type known in the art at the time of the invention in the system of the combination, as disclosed in figure 1 of Erspamer.

5. Claims 9, 10, 21, 22, 38, and 50 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kesler in view of Bryan (US005987979A).

a. Per claim 9, Kesler teaches the invention as explained in the rejection of claim 1. Kesler does not teach a temperature determiner. Bryan teaches a prior art device for measuring track parameters that includes a temperature detector (column 6, lines 44-47) for monitoring the ambient temperature. In the art of measuring track parameters in order to analyze defects, many different parameters may be of interest. Bryan teaches that one of the many different parameters used to determine whether or not a track is defective is ambient temperature. Therefore, it would have been obvious to one of ordinary skill in the art, at the time of invention, to include temperature as a parameter of interest to determine defects.

b. Per claim 10, Kesler teaches the invention as explained in the rejection of claim 1. Kesler teaches using a plurality of different track geometry sensors, but does

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not explicitly recite an accelerometer. Bryan teaches a prior art device for measuring track parameters that includes an accelerometer (207, figure 3) for measuring vehicle accelerations. In the art of measuring track parameters in order to analyze defects, many different parameters may be of interest. Bryan teaches that one of the many different sensors includes an accelerometer. Therefore, it would have been obvious to one of ordinary skill in the art, at the time of invention, to include an accelerometer in a track geometry sensor system, as explicitly taught by Bryan and generally contemplated by Kesler.

c. Per claim 21, Kesler teaches the invention as explained in the rejection of claim 18. Kesler does not teach determining temperature. Bryan teaches a prior art device for measuring track parameters that includes determining temperature (column 6, lines 44-47) for monitoring the ambient temperature. It is a known problem in the prior art that a gyroscope, such as that disclosed by Kesler, suffers from drift caused by temperature. (For example, see Chowdhary (US006360165B1) at column 11, lines 1-4; recognizing the well-known problem in the art of inertial sensors of drift caused by temperature) Therefore, it would have been obvious to one of ordinary skill in the art, at the time of invention, to include determine and compensate for the effect of temperature on the sensors, as it is a well known problem in the art and a temperature sensor, such as that taught by Bryan can be used to correct the problem.

d. Per claim 22, Kesler teaches the invention as explained in the rejection of claim 18. Kesler teaches using a plurality of different track geometry sensors, but does not explicitly recite determining a set of orthogonal accelerations. Bryan teaches a prior

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art device for measuring track parameters that includes an accelerometer (207, figure 3) for measuring vehicle orthogonal accelerations. In the art of measuring track parameters in order to analyze defects, many different parameters may be of interest. Bryan teaches that one of the many different sensors includes an accelerometer. Therefore, it would have been obvious to one of ordinary skill in the art, at the time of invention, to include an accelerometer in a track geometry sensor system, as explicitly taught by Bryan and generally contemplated by Kesler.

e. Per claim 38, Kesler teaches the invention as explained in the rejection of claim 29. Kesler does not teach a temperature determiner. Bryan teaches a prior art device for measuring track parameters that includes a temperature detector (column 6, lines 44-47) for monitoring the ambient temperature. In the art of measuring track parameters in order to analyze defects, many different parameters may be of interest. Bryan teaches that one of the many different parameters used to determine whether or not a track is defective is ambient temperature. Therefore, it would have been obvious to one of ordinary skill in the art, at the time of invention, to include temperature as a parameter of interest to determine defects.

f. Per claim 50, Kesler teaches the invention as explained in the rejection of claim 43. Kesler does not teach determining temperature. Bryan teaches a prior art device for measuring track parameters that includes determining temperature (column 6, lines 44-47) for monitoring the ambient temperature. It is a known problem in the prior art that a gyroscope, such as that disclosed by Kesler, suffers from drift caused by temperature. (For example, see Chowdhary (US006360165B1) at column 11, lines 1-4;

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recognizing the well-known problem in the art of inertial sensors of drift caused by temperature) Therefore, it would have been obvious to one of ordinary skill in the art, at the time of invention, to include determine and compensate for the effect of temperature on the sensors, as it is a well known problem in the art and a temperature sensor, such as that taught by Bryan can be used to correct the problem.

6. Claims 14, 16, 17, 25, 42, 53, 54, and 61 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Kesler and Andersson as applied to claims 13, 40, and 52 above, and further in view of Schroeder et al. (US004726448A).

a. Per claim 14, the combination of Kesler and Andersson teaches the invention as explained in the rejection of claim 13. The combination does not teach a truck lubrication system. Lubrication control systems are well known in the locomotive art. Schroeder teaches one such known prior art system that explicitly teaches a computer-controlled lubricant controller responsive to vehicle sensors, including braking and curve sensors (column 10, lines 54-68). It would have been obvious to one of ordinary skill in the art, at the time of invention, to incorporate a lubrication control system in the track system taught by the combination, as is known in the prior art and evidenced by Schroeder, in order to increase the safety of the vehicle.

b. Per claim 16, Kesler teaches identifying the severity of faults and indicating corrective measures to be implemented immediately and within a predetermined schedule (column 5, lines 55-63).

c. Per claim 17, Kesler teaches that one of the exemplary parameters considered includes curvature (column 5, line 2).

d. Per claim 25, the combination of Kesler and Andersson teaches the invention as explained in the rejection of claim 13. The combination does not teach a truck lubrication system. Lubrication control systems are well known in the locomotive art. Schroeder teaches one such known prior art system that explicitly teaches a computer-controlled lubricant controller responsive to vehicle sensors, including braking and curve sensors (column 10, lines 54-68). It would have been obvious to one of ordinary skill in the art, at the time of invention, to incorporate a lubrication control system in the track system taught by the combination, as is known in the prior art and evidenced by Schroeder, in order to increase the safety of the vehicle.

e. Per claim 42, the combination of Kesler and Andersson teaches the invention as explained in the rejection of claim 40. The combination does not teach a truck lubrication system. Lubrication control systems are well known in the locomotive art. Schroeder teaches one such known prior art system that explicitly teaches a computer-controlled lubricant controller responsive to vehicle sensors, including braking and curve sensors (column 10, lines 54-68). It would have been obvious to one of ordinary skill in the art, at the time of invention, to incorporate a lubrication control system in the track system taught by the combination, as is known in the prior art and evidenced by Schroeder, in order to increase the safety of the vehicle.

f. Per claim 53, the combination of Kesler and Andersson teaches the invention as explained in the rejection of claim 52. The combination does not teach a truck lubrication system. Lubrication control systems are well known in the locomotive art. Schroeder teaches one such known prior art system that explicitly teaches a

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computer-controlled lubricant controller responsive to vehicle sensors, including braking and curve sensors (column 10, lines 54-68). It would have been obvious to one of ordinary skill in the art, at the time of invention, to incorporate a lubrication control system in the track system taught by the combination, as is known in the prior art and evidenced by Schroeder, in order to increase the safety of the vehicle.

g. Per claim 54, Kesler teaches a track analyzer including a track detector for determining track parameters (36, figure 2), a vehicle detector for determining vehicle parameters (40, figure 2), and a computing device (52, figure 2) for determining in real time if the track parameters are within acceptable tolerances and if not, generating corrective measures (column 5, lines 40-47). Kesler does not teach communicating the corrective measures to a locomotive control computer associated with a vehicle. Andersson teaches a track parameter sensing and storing system that further communicates track parameters and corrective measures to a locomotive control computer (column 5, lines 15-22). It would have been obvious to one of ordinary skill in the art, at the time of invention, to communicate the corrective measures and track parameter data to a locomotive control computer so that the vehicle may make immediate corrective maneuvers for added safety, as taught by Andersson. The combination does not teach a truck lubrication system. Lubrication control systems are well known in the locomotive art. Schroeder teaches one such known prior art system that explicitly teaches a computer-controlled lubricant controller responsive to vehicle sensors, including braking and curve sensors (column 10, lines 54-68). It would have been obvious to one of ordinary skill in the art, at the time of invention, to incorporate a

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lubrication control system in the track system taught by the combination, as is known in the prior art and evidenced by Schroeder, in order to increase the safety of the vehicle.

h. Per claim 61, Kesler teaches a method for a train traveling on a track including determining track parameters (36, figure 2), determining vehicle parameters (40, figure 2), and determining in real time if the track parameters are within acceptable tolerances and if not, generating corrective measures (column 5, lines 40-47). Kesler does not teach communicating the corrective measures to a locomotive control computer associated with a vehicle. Andersson teaches a track parameter sensing and storing system that further communicates track parameters and corrective measures to a locomotive control computer (column 5, lines 15-22). It would have been obvious to one of ordinary skill in the art, at the time of invention, to communicate the corrective measures and track parameter data to a locomotive control computer so that the vehicle may make immediate corrective maneuvers for added safety, as taught by Andersson. The combination does not teach a truck lubrication system. Lubrication control systems are well known in the locomotive art. Schroeder teaches one such known prior art system that explicitly teaches a computer-controlled lubricant controller responsive to vehicle sensors, including braking and curve sensors (column 10, lines 54-68). It would have been obvious to one of ordinary skill in the art, at the time of invention, to incorporate a lubrication control system in the track system taught by the combination, as is known in the prior art and evidenced by Schroeder, in order to increase the safety of the vehicle.

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7. Claims 33-35 and 45-47 are rejected under 35 U.S.C. 103(a) as being unpatentable as obvious over Kesler.

a. Per claim 33, Kesler teaches the invention as explained in the rejection of claim 29. Kesler further teaches detecting vehicle distance traveled (column 4, line 27) and GPS (40, figure 2). Kesler does not explicitly teach an accelerometer, detecting speed, or detecting a force on the drawbar. However, these vehicle parameters are common in the industry and are routinely measured in all trains. Speed is the most obvious parameter that, while not explicitly taught by Kesler, is obvious to one of ordinary skill in the art at the time of the invention to be measured in any train system. The acceleration and drawbar force are also similarly commonly measured in trains and would have been obvious to one of ordinary skill in the art at the time of the invention. As evidence, a typical train control display that shows speed, acceleration, and drawbar force is illustrated in figure 5 of Nickles et al. (US006144901A). It would have been obvious to one of ordinary skill in the art, at the time of invention, to measure speed, acceleration, and drawbar force of a train, as is well known by one of ordinary skill in the art at the time of the invention.

b. Per claims 34 and 35, mechanical and optical speed determiners were well known to one of ordinary skill in the art at the time of the invention.

c. Per claims 45-47, mechanical and optical speed determiners were well known to one of ordinary skill in the art at the time of the invention.

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8. Claim 41 is rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Kesler and Andersson as applied to claim 29 above, and further in view of Murray et al. (US003976272A).

a. Per claim 41, the combination teaches the invention as explained in the rejection of claim 40. The combination does not teach that a communication system communicates with an upcoming track feature to determine the condition of the feature. Murray teaches a railroad control system that includes communicating with a train about the condition of upcoming track features, such as track switches (see column 8). It would have been obvious to one of ordinary skill in the art, at the time of invention, to communicate about the condition of upcoming track features as is known and practiced in the art, as evidenced by Murray.

9. Claim 44 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kesler in view of Murray et al. (US003976272A).

a. Per claim 44, Kesler teaches the invention as explained in the rejection of claim 43. Kesler does not teach communicating with an upcoming track feature to determine the condition of the feature. Murray teaches a railroad control system that includes communicating with a train about the condition of upcoming track features, such as track switches (see column 8). It would have been obvious to one of ordinary skill in the art, at the time of invention, to communicate about the condition of upcoming track features as is known and practiced in the art, as evidenced by Murray.

Allowable Subject Matter

10. Claims 59 and 60 are allowed.

a. Per independent claim 59, the prior art does not teach or reasonably suggest in combination the present method for a vehicle traveling on a track that includes determining a balance speed parameter, determining whether the balance speed parameter is within acceptable tolerances, if not, determining an optimized lubrication strategy for the vehicle, and communicating the optimized strategy to a lubrication system as claimed.

b. Per independent claim 60, the prior art does not teach or reasonably suggest in combination the present method for a vehicle traveling on a track that includes determining a balance speed parameter, determining whether the balance speed parameter is within acceptable tolerances, if not, determining an optimized steering strategy for the vehicle, and communicating the optimized strategy to a steering system as claimed.

11. Claims 55-58 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

a. Per claim 55, the prior art does not teach or reasonably suggest in combination the present track/vehicle analyzer that includes determining a balance speed parameter, determining whether the balance speed parameter is within acceptable tolerances, if not, determining an optimized lubrication strategy for the vehicle, and communicating the optimized strategy to a lubrication system as claimed.

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b. Per claim 57, the prior art does not teach or reasonably suggest in combination the present track/vehicle analyzer that includes determining a balance speed parameter, determining whether the balance speed parameter is within acceptable tolerances, if not, determining an optimized steering strategy for the vehicle, and communicating the optimized strategy to a steering system as claimed.

c. Claims 56 and 58 depend from claims 55 and 57 and would serve to further define the invention over the prior art.

Conclusion

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Wiseman et al. (US005598782A) teaches methods of railway track maintenance. Stewart et al. (US004367681A) teaches a dynamic loading correcting device.

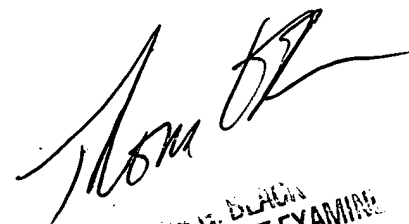
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Eric M. Gibson whose telephone number is (571) 272-6960. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas Black can be reached on (571) 272-6956. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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EMG



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